Retirement and Primary Cardiac Arrest in Males

David S. Siscovick, MD, MPH, David S. Strogatz, PhD, Noel S. Weiss, MD, DrPH, and Gad Rennert, MD

Abstract: We investigated the association between retirement and primary cardiac arrest (PCA) in 126 male cases and controls, 25–75 years of age, without prior heart disease or comorbidity. After adjustment for age alone, retirement was not associated with an increased risk of PCA, (OR = 1.1; 95% confidence intervals = 0.5, 2.4). This lack of association was not uniform across age strata, however. In 10 of 19 discordant pairs 60 or more years of age, the control subject had been retired; in all seven discordant pairs under 60, the case had been retired (lower 95% CI of the relative risk = 1.9). (*Am J Public Health* 1989; 79:207–208.)

Introduction

Clinicians have long suspected that retirement might increase the risk of coronary heart disease (CHD).[1] Retirement represents one of several profound exit/loss events, such as widowhood, death of friends or relatives, divorce, and relocation, that become more prevalent with increasing age.[2] The literature on retirement and physical health is fairly small and marked by contradictory findings and important methodologic limitations.[3–5] We analyzed data from a community-based study of potential risk factors for primary cardiac arrest[6] to determine the influence of retirement. Since our study was restricted to persons who were clinically healthy, we were able to minimize potential bias related to the fact that poor health is one determinant of retirement.[7]

Methods

The design of this study has been presented in detail elsewhere.[6] Briefly, from reports by trained paramedics in Seattle and suburban King County, Washington between December 1979 and January 1981, all 1,250 cases of out-of-hospital primary cardiac arrest were identified. Cases were characterized by a sudden pulseless condition without evidence of a non-cardiac condition as the cause of cardiac arrest.

Because we required detailed information regarding the prior experience of each subject, we restricted the study population to married residents of King County, 25–75 years of age (779 cases). In addition, based on the emergency medical service report or a brief telephone screening interview with the spouses of potential cases, persons with the following conditions were excluded: a history of prior clinically recognized heart disease (492 cases), such as angina pectoris, myocardial infarction, coronary artery bypass surgery and graft, congestive heart failure, arrhythmias, cardiomyopathy, congenital or valvular heart disease; or comorbidity that "limited their usual activity" (103 cases), such as cancer, chronic lung, renal or liver disease. Thus, there were 184 cases eligible for inclusion in this study; they represented persons who appeared and acted as if they were "healthy" until the time of their primary cardiac arrest.

After each case was identified, a control subject matched for age (within seven years), sex, marital status, and urban or suburban residence was selected from the community using random digit dialing.[8] Spouses of potential controls were queried by telephone in a fashion similar to those of cases; potential controls with a history of prior clinically recognized heart disease or comorbidity were excluded. Of eligible subjects identified, the spouses of 89 percent of the cases and 85 percent of the controls complied with a more extensive in-home interview. Thus, there were 163 cases and 163 controls in our study population; 18 percent of subjects were female, 94 percent were White, and the mean age was 58 years.

The home interview verified the absence of prior clinically recognized heart disease or comorbidity and covered factors such as history of hypertension treatment, current cigarette smoking, habitual vigorous leisure-time activity, history of diabetes mellitus, and alcohol consumption. We also asked whether the subject was currently employed and, if not, whether the subject was retired and formerly employed, not working currently but temporarily laid off and seeking employment, or never employed. Information regarding the specific age of retirement and reasons for retirement was not obtained. These investigations were completed in 1981.

We restricted this analysis to the 127 male case-control pairs in which both members were either employed or retired. Among the six male case-control pairs that were excluded, four of the cases and two of the controls were temporarily laid off and seeking employment. One additional pair was excluded because of missing data related to employment status.

An unadjusted matched-pairs analysis and a conditional multiple logistic regression analysis for matched case-control data were used in this study.[9] Factors evaluated simultaneously using the matched-pair multiple logistic model included history of hypertension treatment, current cigarette smoking, habitual vigorous activity, and alcohol consumption. We included age as a continuous variable to control for residual confounding related to age. To explore possible differences between early and conventional retirement (as represented by age at interview), we used a dichotomous variable for age (<60 years, >60 years).

Results

Cases were more likely to be retired compared to controls (Table 1); comparing retired men with currently employed, the estimated relative risk was 1.7 (95% confidence intervals = 0.8, 3.4). However, the estimate of the relative risk was 1.1 either after adjustment for age alone (95% CI = 0.5, 2.4) or after simultaneous adjustment for age, history of hypertension treatment, current cigarette smoking, habitual physical activity, and alcohol consumption (95% CI = 0.5, 2.8).

Address reprint requests to David S. Siscovick, MD, MPH, Division of General Internal Medicine, Harborview Medical Center ZA-60, Seattle, WA 98104. He is also with the Departments of Medicine and Epidemiology, University of Washington; Dr. Weiss is with the Department of Epidemiology, U-WA School of Public Health and Community Medicine, Seattle; Dr. Strogatz is with the Department of Epidemiology, University of North Carolina School of Public Health, Chapel Hill; Dr. Rennert is with the Department of Family and Community Health, Kupat Holim and Technion School of Medicine, Haifa, Israel. This paper, submitted to the Journal August 22, 1988, was revised and accepted for publication June 27, 1989.

TABLE 1—Distribution of Primary Cardiac Arrest Case-Control Pairs According to Retirement Status, King County, Washington, December 1979–January 1981

Retirement by Control	Retirement by Case	
	Yes	No
Yes	27	12
No	20	68

Among case-control pairs less than 60 years of age, cases were more likely to be retired compared to controls (Table 2); in all seven discordant pairs it was the case who had been retired (relative risk = infinity, lower 95% CI = 1.9). Of note, among subjects less than age 60, the prevalence of cigarette smoking, obesity, diabetes, family history of heart disease, and alcohol consumption was similar among retired and employed men; however, prior hypertension treatment was more common among retired (62 percent) than employed (25 percent) men. There was no relation between retirement and the risk of primary cardiac arrest among men greater than or equal to 60 years of age, as reflected by an estimated relative risk of 0.9 (95% CI = 0.3, 2.7).

Discussion

There are several limitations of our analysis: we did not obtain specific information on the reasons for retirement; we do not know the extent to which retirement was involuntary. However, our study was restricted to persons without clinically recognized heart disease or comorbidity that limited their usual activity; only 8 percent of subjects had more than three restricted bed days over the prior six months and less than 1 percent had more than six days. For these reasons, we consider it unlikely that physical disability was a major determinant of retirement in our study. Since we did not obtain information on the time since retirement began, we were not able to determine if this factor influenced the risk related to retirement. Finally, because of the small number of retired men in our analysis, we were not able to fully explore potential confounding related to other risk factors for the age-specific estimates of risk related to retirement.

TABLE 2—Distribution of Primary Cardiac Arrest Case-Control Pairs* According to Age and Retirement Status, King County, Washington, December 1979–January 1981

Age	Retirement by Control	Retirement by case	
		Yes	No
<60	Yes	0	0
	No	7	57
>60	Yes	27	10
	No	9	4

*10 case control pairs where both subjects were not in the same age stratum were excluded from this table.

We chose a cut-point of age 60 for early retirement because we considered retirement prior to that age unambiguously early. For a later cut-point, such as age 62, the magnitude of the increase in risk related to early retirement decreased (relative risk = 2.8, 95% confidence intervals = 0.9, 8.2) but the direction of the interaction between age and retirement on the risk of primary cardiac arrest remained the same. Nevertheless, for the reasons noted above, our finding of an increase in the risk of primary cardiac arrest among younger but not older men should be viewed as preliminary. Because of the magnitude of the association of retirement with primary cardiac arrest that we observed in relatively young men, the benefits and risks of early retirement deserve further study.

ACKNOWLEDGMENTS

The authors thank Drs. Leonard Cobb and Mickey Eisenberg and the research staffs of the Seattle Medic One and the Seattle-King County Health Department Project Restart Programs for their helpful cooperation; and Emma Lancaster, Lucile Wright, Rosalie Wendt, Judith Fiedler, Joanne Beaurain, and Pam Nelson for technical assistance.

Supported by grant HL26208-02 from the National Institutes of Health and a grant from the Graduate School Research Fund of the University of Washington. Dr. Siscovick was a Robert Wood Johnson Clinical Scholar and a Preventive Cardiology Academic Awardee of the National Heart, Lung, and Blood Institute.

REFERENCES

1. Gonzalez ER: Retiring may predispose to fatal heart attack. JAMA 1980; 243:13–14.
2. House JS: Chronic life situations and life change events: content discussion. *In*: Ostfeld AM, Eaker ED (eds): Measuring Psychosocial Variables in Epidemiologic Studies of Cardiovascular Disease: Proceedings of a Workshop. NIH Pub. No. 85-2270. Washington, DC: Govt Printing Office, 1985.
3. Minkler M: Research on the health effects of retirement: An uncertain legacy. J Health Soc Behavior 1981; 22:117–130.
4. Haynes SG, McMichael AJ, Tyroler HA: The relationship of normal involuntary retirement to early mortality among US rubber workers. Soc Sci Med 1977; 11:105–114.
5. Casscells W, Hennekens CH, Evans D, Rosner B, DeSilva RA, Lown B, Davies JE, Jesse MJ: Retirement and coronary mortality. Lancet 1980; 1288–1289.
6. Siscovick DS, Weiss NS, Hallstrom AP, Inui TS, Peterson DR: Physical activity and primary cardiac arrest. JAMA 1982; 248:3113–3117.
7. McMichael AJ, Haynes SG, Tyroler HA: Observations on the evaluation of occupational mortality data. JOM 1975; 17:128–131.
8. Cummings KM: Random digit dialing: A sampling technique for telephone surveys. Public Opin Q 1979; 43:233–44.
9. Breslow NE, Day NE, Halvorsen KT, *et al:* Estimation of multiple relative risk functions in matched case-control studies. Am J Epidemiol 1978; 108:299–307.